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Half-size me? How calorie and price information influence ordering on restaurant menus with both half and full entrée portion sizes

Kelly L. Haws [a, *], Peggy J. Liu [b]

[a] Owen Graduate School of Management, Vanderbilt University, 401 21st Avenue South, Nashville, TN 37203, USA
[b] Fuqua School of Business, Duke University, 100 Fuqua Drive, Durham, NC 27708, USA

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ABSTRACT

Many restaurants are increasingly required to display calorie information on their menus. We present a study examining how consumers' food choices are affected by the presence of calorie information on restaurant menus. However, unlike prior research on this topic, we focus on the effect of calorie information on food choices made from a menu that contains both full size portions and half size portions of entrées. This different focus is important because many restaurants increasingly provide more than one portion size option per entrée. Additionally, we examine whether the impact of calorie information differs depending on whether full portions are cheaper per unit than half portions (non-linear pricing) or whether they have a similar per unit price (linear pricing). We find that when linear pricing is used, calorie information leads people to order fewer calories. This decrease occurs as people switch from unhealthy full sized portions to healthy full sized portions, not to unhealthy half sized portions. In contrast, when non-linear pricing is used, calorie information has no impact on calories selected. Considering the impact of calorie information on consumers' choices from menus with more than one entrée portion size option is increasingly important given restaurant and legislative trends, and the present research demonstrates that calorie information and pricing scheme may interact to affect choices from such menus.

Calorie labeling and the portion size of foods are two issues currently at the forefront of the minds of food manufacturers, researchers, consumer advocates, and public policy makers alike as efforts continue to try to understand and influence the factors that have contributed to unhealthier consumption and increasing rates of overweightness and obesity (Nestle, 2010; Raynor, 2014). Understanding food consumption is complex, as many factors impact consumers' food choices, leading to "value negotiations" as consumers try to address taste, health, and price concerns among other factors (Furst, Connors, Bisogni, Sobal, & Falk, 1996; Glanz, Basil, Maibach, Goldberg, & Snyder, 1998), Although these factors are often examined separately in research studies, real decision making situations involve people very quickly weighing a variety of factors, often involving direct trade-offs (e.g., between tastiness and health [Liu, Haws, Lamberton, Campbell, & Fitzsimons, 2015b; Raghunathan, Naylor, & Hoyer, 2006]; price and health [Haws, Reczek, & Sample, 2015; Hughner, McDonagh, Prothero, Shultz, & Stanton, 2007]; and portion size and price [Haws & Winterich, 2013]). In the present research, we present an empirical study specifically examining the effect of calorie information on entrée selection from a restaurant menu containing both full and reduced-portion size offerings, consistent with emerging practices in the restaurant industry. We also examine whether the effect of calorie information in this context differs by pricing scheme.

1. Background

1.1. Recent restaurant menu changes: calorie labeling and reduced portion options

Coupled with the increasing trend toward eating more away from home is a fairly recent shift in public policy in the United States (included in the Patient Protection and Affordable Care Act of 2010) recognizing the importance of the provision of nutritional information in restaurant environments (Koh & Sebelius, 2010; Nestle, 2010). Specifically, Section 4205 of the Patient Protection and Affordable Care Act requires chain restaurants with twenty or

* Corresponding author.
E-mail addresses: Kelly.haws@vanderbilt.edu (K.L. Haws), peggy.liu@duke.edu (P.J. Liu).

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more locations to display calorie information on their menus. Such information has long been available on consumer packaged goods (per the requirements set forth by the Nutrition Labeling and Education Act of 1990), but only recently have chain restaurants been required to provide nutritional information. The basic notion, similar to that for packaged goods (Balasubramanian & Cole, 2002), is that displaying calorie information provides consumers with the information needed to make healthier choices (Taylor & Wilkening, 2008). However, evidence regarding the effectiveness of providing calorie information has been mixed, with some finding no impact of calorie information on calories ordered and others finding a small to moderate impact (for summaries, see Kiszko, Martinez, Abrams, & Elbel, 2014; Liu, Wisdom, Liu, Roberto, & Ubel, 2014). Further, evidence suggests more or less effective methods of displaying this information based on increasing its prominence on menus or increasing the ease with which it can be interpreted (Bleich, Herring, Flagg, & Gary-Webb, 2012; James, Adams-Huet, & Shah, 2015; Liu, Roberto, Liu, & Brownell, 2012; Morley et al., 2013).

Similar emphasis has also been placed on the role of expanding portion sizes, which have been noted as a key contributor to increasing obesity (Raynor, 2014; Young & Nestle, 2002) and are considered especially problematic in restaurant contexts. Indeed, some politicians have recently supported placing limits on the soft drink portion sizes that can be sold by restaurants and other eating establishments (Fairchild, 2013). Given the increased emphasis placed on portion sizes, many restaurants have begun to offer smaller portion sizes of their full-sized entrées. For instance, as of 2015, both Applebee's and Cheesecake Factory, as well as many other popular restaurants, provided lunch-sized portion entrées on their menus. Portion size is of particular importance as research shows that people tend to consume most of what they order or serve themselves (Schwartz, Riis, Elbel, & Ariely, 2012). Further, in a restaurant setting, consumers tend to assume that the portion size served constitutes the amount recommended for consumption in a single sitting, regardless of the actual portion size offered (Roberto & Khandpur, 2014).

1.2. Layering on pricing strategies

These two recent developments (offering different portion size options for entrées and providing calorie information) have naturally led to a more complex decision-making environment. Yet the complexity of the food decision-making environment does not stop there: another important criterion in food choice is price (Glanz et al., 1998; Haws & Winterich, 2013). Interestingly, whereas overall money spent may be a clear metric of food cost, prior research has demonstrated that consumers often focus on price per unit, particularly when doing so provides justification for more indulgent behavior such as a larger milkshake (Haws & Winterich, 2013).

Consider the following scenario: Imagine you walk into a casual dining restaurant that offers a variety of options, some of which immediately sound healthy and others less so. Per the requirements of the Patient Protection and Affordable Care Act of 2010, the restaurant now posts calorie information for each menu item. You notice that they offer both full and half portion options of many of their most popular entrées. With respect to pricing of different entrée sizes, three possibilities exist, two of which we contend are much more likely (Dobson & Gerstner, 2010; Haws & Winterich, 2013). First, one possibility is that different portion sizes may be offered according to a linear pricing scheme, whereby the price per unit of the product is consistent across the larger and smaller portion sizes. Another possibility, which is likely more common than the first due to expectations based on prior experiences in the market place (Wansink, Kent, & Hoch, 1998), is that different portion sizes may be offered according to a non-linear pricing scheme, whereby the price per unit of the product is lower for the larger portion sizes. A third possibility may involve what has been called a quantity surcharge, whereby the price per unit increases as quantity increases (Manning, Sprott, & Miyazaki, 1998). However, we believe that quantity surcharges are unlikely to occur in the restaurant context, and as such, we focus our present research on linear and non-linear (with quantity discounts) pricing schemes.

2. The present research

To our knowledge, this is the first research to examine the impact of calorie information provision on menus with both full and reduced portion sizes (offered with different pricing schemes). As such, we seek to provide a more robust view of efforts to provide consumers with the information (nutritional) and alternatives (multiple portion sizes of different entrées varying in perceived healthiness) necessary to make healthier choices when the practical and powerful role of pricing is also taken into account. Specifically, we ask the following questions: In a menu context in which portion size alternatives are offered, does calorie information have a different impact in the presence of linear versus non-linear pricing? If so, how? Does the pricing scheme change the impact of providing calorie information on calories ordered? If so, does this change in calories ordered occur due to differences in the "nature" of items ordered (healthy or less healthy), differences in portion sizes ordered, or both?

3. Study

3.1. Method

3.1.1. Participants and design

Participants ($N = 245$) were recruited from an online panel of U.S. adult consumers (Amazon Mechanical Turk) to complete a study described as being about consumer decision making. Amazon Mechanical Turk has been validated in previous research (Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010) and has been used in other food decision-making studies on calorie information (Brochu & Dovidio, 2014; Liu, Bettman, Uhalde, & Ubel, 2015a; Parker & Lehmann, 2014). The sample size was determined prior to launching the study: we aimed for approximately 60 participants per condition, exceeding Simmons, Nelson, and Simonsohn (2011)'s suggestion that at least 20 participants per condition be used. Participants were randomly assigned to view one of four versions of a menu, based on a 2 (calorie information: present vs. absent) $\times$ 2 (pricing: linear vs. quantity discounted) between-subjects design. This study was programmed and hosted using an online survey tool (Qualtrics) and administered in May 2015. Analyses were conducted from May to July 2015. The study was approved by the primary university's Institutional Review Board.

3.1.2. Development of menu stimuli (entrées)

The menu contained 10 different entrées offered in two different sizes (full and half-size), such that participants had 20 possible options to choose from. Great care was taken to develop the menu and its four different versions. To begin, the 10 entrées were selected to represent five "healthier in nature" and five "less healthy in nature" entrées and were paired such that the same general dish type was represented both as a "healthier in nature" entrée and as a "less healthy in nature" entrée (e.g., we included a "healthier in nature" salad and a "less healthy in nature" salad; a "healthier in nature" fish dish and a "less healthy in nature" fish dish, etc.), and developed based on prior research (Parker &